

U. S. Department of Agriculture.

FIELD DIARY

OF

Mr. Vernon Bailey  
Biological Survey  
(Official title.)  
Glacier Park,  
1917.  
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8-2887

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*D. F. Houston*  
Secretary of Agriculture.

8-2887

1917

July 1. Left Washington for  
Glacier Park 6:15 P.M. on  
P.A.Ry. Cool & pleasant.  
Crops good & winter  
wheat ripening and a few  
fields cut.

July 2. Daylight in Ohio.  
Crops late & winter  
wheat headed out but  
still green. Corn and  
only 4 or 5 inches high.  
Reached Chicago 2 P.M.  
and left at 10 P.M. on  
C.R.R.Q.

July 3. Daylight along  
east shore of Lake Pepin  
Started St Paul at 10 AM.  
cd from Minneapolis,  
went up west side of Miss.  
R. to Monticello & St. Cloud  
cd reached Fargo at  
7 P.M.

Crops in Minn - & Dak.  
good but late & small.  
corn only 2 or 3 inches  
high. only a few early  
potatoes in blossom.

Flowers mainly Epicharis,  
Puccoon, wild roses,  
Orange Milkweed, galium,  
Aubrieta borealis, Geranium,

July 4. Wakes up at Williston,  
N.D. A good growth of  
short grass over prairie.  
Dry farm crops fair.  
Winter wheat heading out.

Montana.

Cactus & wild roses in blossom.	
<u>Miss. River</u> . -	
<i>Populus fremontii</i>	abn.
<i>Negundo</i>	
<i>Salix</i>	"
<i>Lipargyna angustia</i>	"
<i>Elaeagnus angustia</i>	"
<i>Artemesia cana</i>	"
<i>Helianthus annuus</i>	"
<i>Opuntia macrorhiza</i> , var.	
<i>Malvastrum coccineum</i>	"

At lakes east of Malta saw  
3 Pelicans, great blue herons, ducks,  
Avocets, Gulls, Phalaropes & lots of  
waders, terns etc.  
Big tulip bordered lakes  
Sage grouse near Chenoak 4

Prairie dogs, a few at Glasgow  
+ Chenoak + Horne +  
Tremblin & Gifford, Chester,  
Devon, Shelby

Citrus richardsoni, all along to  
Shelby +

Glacier Park Hotel

4 Buffalo heads mounted & 24 skulls.  
10 Sheep skulls  
1 Mule deer head, mounted \$27.50  
White tail deer heads mounted  
26 Grizzly bear skins of many kinds.  
3 Alaska brown bear skins

July 5 - Glacier Park Hotel,  
Hunted and trapped and  
waited for Mr. Goodwin,  
the

July 6 ~~Saturday~~

~~July 6~~ Up to Two Medicine Lakes  
and return, up to meadowline  
where sheep trails were common &  
Hudsonian zone flowers & plants  
profuse. Elk tracks common in  
trails. Fresh bear sign of all  
green plants.

Canadian zone west of way.

*Pinus murrayana* abundant, *Pinus flexilis* on lower hills, altitudinal  
up above lakes. *Pseudotsuga*  
along lower lake, *Picea engelmanni*  
& *Abies lasiocarpa* common cold slopes  
to timberline. *Populus tremuloides* along  
streams, aspens on slopes & bottom.  
Alders & willows abundant.

July 7. Left Glacier at 1:30  
+ reached Many Glaciers hotel at  
4:30 - 55 miles.

The road crosses big moraine  
between Two Medicine & Cut Bank  
then a broad valley and over  
another moraine to Milk River,  
then over another to Divide Dr.  
and a point of forested mountain  
+ down to St. Mary Lake.  
then around lower St. Mary L.  
+ up the Swift current to  
Many Glaciers hotel.

The plains country species  
come into edge of park at  
Cut Bank where *Citellus richardsoni*  
was seen along the road + may  
extend actually into the park,  
as at lower end of upper St. Mary  
Lake where richardsoni is  
abundant actually inside of  
the park boundary.

This big flat is the lowest  
of most plains like of any  
~~pointed~~ along the east slope.  
& the only real transition zone  
spot.

Lake McClelland is in pure  
Canadian with *Pinus murrayana*,  
*Picea engelmanni*, *Abies* & *Balsam*  
*poplars* & *Aspens* as the most  
abundant forest trees.

See note book for list of plants.

July 8 - Went up to Lake Josephine along south side & around & back on North side. Saw bear tracks & lots of birds & a few Columbia ground squirrels & mule deer tracks & heard pine squirrels. Saw flocks of 11 or 12 downy young Goldeneyes & a brood of 3 older ones & a few old females without young.

The Garden Wall is a great line of sheer crags & cliffs around the head of this valley hanging with glaciers & snow fields and inclosing lakes and streams in the forested basins below.

Grinnell Mountain across the lake from the hotel partly hides the Grinnell glacier just above Grinnell lake.

July 9 Took saddle horses & went up ~~Cascade~~ Creek to Crooked Lake and Sheep Glacier and found a new and unmapped glacier above it to the north. The lake is about two miles in an open valley between great crags. The glaciers are at the foot of great cliffs & both are small. The lake is milky green. Great snow banks come down to it.

Saw a hoary marmot & lots of Columbia ground squirrels & some tracks of sheep or goats. One bear track on trail & one elk track.

Wonderful flower parks & meadows & slopes. Low blue columbines, Drypts, Sibaldia, penstons, Silene, etc.

July 10, Many Glacier.

Caught Cetulus down on  
big flats below the falls

July 11 Went up to Grinnell  
Lake and explored the head of the  
canyon but found no goats or  
sheep. Set traps in the woods

July 12 Went to Iceberg Lake  
and followed goats over the cliffs

July 13 Caught Woodrat &  
photographed it & ground-  
squirrels. Gave talks in evening  
to people at Hotel.

July 14 - Bright & fair-

July 15 " "

July 16 - Went over Swift-current  
Pass to Granite Park where  
arrived at noon. In P.M.  
went to top of Swift current lake

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and made list of plants & collected specimens. & photographed Ptarmigan & young that Mrs. Bailey found just south of the pass.  
Staid over night at the Granite Park Chalet.

A wonderful panorama of snow capped & ice clad peaks & ranges all around. Mrs. Bailey saw one goat & five mule deer ran past the Chalet. Lots of goat & sheep tracks & trails over the slopes but too many tourists have scared most of the animals away.

July 18 - Went around the point north of the Chalet and found where the hoary marmots lived along a cliff & on the big boulders below. First heard the long, loud & shrill & evenly sustained whistle, like a police whistle only more penetrating. Found 2 sitting on a ledge where they could overlook the whole valley and another before on a big boulder. Their long and bushy tails and galloping gait are very striking characters.

Mrs. Bailey saw 3 mountain sheep in the pass & Mrs. Yard saw 2 near the Chalet.

Several more ptarmigans were seen and another marmot.

Old cover sign & bay & woodrat signs seen in rock slide at 4500 ft.

July 18 - Went down into the meadow south of the Cobolt & on the ridge beyond where I could see the whole length of Lake McDonald.

Wonderful flower gardens cover the ridges & meadows, acres of great yellow *Erythronium* in solid stands, fields of big creamy buttercups, shooting stars, spring beauties, buttercups, *Dianthus* - dandelions.

Bears had dug yards of sod out in search of *Erythronium* bulbs, some very fresh. These big crisp, tender bulbs are very pleasant tasting & more delicate than carrots.

Bears have also dug out numerous quakingworts last fall, tearing at rocks & bear grass roots & stones & one little balsam tree & generally grubbing the nest down 2 or 3 feet, & 4 to 8 feet back.

Extreme timberline is at about 5000 feet on SW slope of Swiftcurrent Peak on SW slope and this seems to be as high as any.

7000 on NE slopes seems to be about the average, tho in shot in cires like Crackers & Seabird & Grinnell it is not above 6000 feet.

A porcupine got into the other house & came around the garbage pile for food.

Showshoe rabbit signs seen in brush

In PM returned to Many Forks Glacier. Found Cassiope in the Pass and great beds of Dryas + Silene acaulis, Bryanthus & Kalmia glauca, a big white Caltha or Ranunculus, besides lots of shooting stars, buttercups, Potentillas etc. There are many large snowbanks still lying in the pass and patches of dwarf spruce & fir - *Pinus albicaulis* scattered over it, but all much flattened & dwarfed.

The trail makes numerous zigzags down a steep wall over a 1000 feet & strikes the bottom of Swiftcurrent Valley.

July 19. Wrote reports and notes  
of the last trip

July 20 - Walked down to  
the upper Sherburne Lake  
through the flat valley bottom  
over 3 large prairie strips  
and in the willows and aspens  
between. Found a fish hawk's  
nest & a lot of valley birds.  
Some good beaver dams & ponds  
& houses along side creeks and  
an old dam and a big house  
on flooded bottom of Sherburne  
Lake. A dam is being built  
across the lower end of the lake  
by the Reclamation Service to  
make a reservoir of the valley &  
the beavers are crowded back up the  
valley as the water rises.  
Saw a muskrat & a big bear track  
& lots of *Citellus columbianus*  
close down to the lake, and lots  
of big hills of *Hornungia tenuipilis*  
at lower part of valley.

July 10 Weather d. t.

July 21. Took part of our outfit needed for camping ad came around by stage to St. Mary where we stopped over night to study birds & mammals of the low country below the bluffs. Tramped over the big prairie flats below the Ruffed Lake where *Citellus richardsoni* & gopher hills are abundant inside the Park line. This flat is 4448 feet, the lowest point on the east slope of the Park and brings a number of low plains species into the Park that are not found elsewhere in it. viz. *Citellus richardsoni* + *Thlaspidos* + *Micromys dimidiata* + species of birds & plants.

The black flies are the worst I ever saw them & make life unbearable in the open. They are the poorest ticks.

July 22. Sunday. Took boat at 11:15 AM for Sun Camp about 3 miles below upper end of Upper St. Marys Lake. Arrived at 12:30 and found a most picturesque chabt on a high point of wind swept rocks at the very foot of going to the Sun Mtn.

In PM followed trail above head of lake & met Harold Bryant & party - his wife & Mr. Gerstey of Los Angeles & his wife & Mrs. Rish of Boston & her son.

Found water ouzel nest under falls of Baring Creek.

Good trail through dense forest all up north side of lake. Timber mainly Lodgepole Pine, Spruce & fir, but a little P. flexilis & Pseudotsuga, also Populus tremuloides & balsamifera.

July 23 - Went up Baring Creek to Sexton Glacier on east side of Going to the Sun Peak. Mapped the life zones and took photographs of white goats - at 7500 feet, near the Sexton Glacier. Collected Arctic Alpine Plants. Returned to Sun Camp at the edge of St. Mary's Lake and near the foot of Going & the Sun Mts. Saw a  $\Sigma$  apus near timberline.

July 24 Did not work far from Camp. Listed trees + plants + birds + mammals. Saw a large Porcupine in evening.

July 25. Went up Roes Creek around the east side of Goat Mtn. but not to extreme head of creek. This is a long valley full of dense timber and a big looking creek. The trail has not been cut out for many years and no one has been in the canyon lately if at all this year. There is no great scenery or special attraction in the canyon & it is a good game region. Saw a few elk or deer tracks and numerous trails of goat & sheep high up and lots of signs of bear. The trail had best remain closed as a protection to game. Tramped at least 20 miles about keep without trail.

July 26 - Moved camp up  
to near Piegan Pass and nearer  
to Siyeh Pass where we camped  
just below the lakes at 7000 feet  
in Huckleberry zone, where sheltered  
dwarf spruce & fir & *Pinus albicaulis*  
and in meadows of *Erythronium*,  
*Pulsatilla*, *Bryanthus*, *Cassiopea*  
& dwarf willows. Big snowbanks  
& ice rimmed lakes lie just  
above us and the bare carpet of  
Arctic Alpine plants covers  
the Siyeh Pass saddle just  
700 feet above us.

Saw 8 goats on north slope of  
Going to the Sun Mtn.

listed & collected plants over  
the pass.

Goats 9, 4, 5, 3, 1, 1,  
 Mule deer, 18 near camp  
*Citellus californicus*, <sup>en</sup>  
*Callospermophilus*, 1 at 7600 ft.  
 Entomias <sup>2</sup> <sup>P</sup>  
*Microtus macrourus*, <sup>2</sup> <sup>2</sup> <sup>P</sup> <sup>en</sup>.  
 Eriomys 2  
*Peromyscus* 1  
*Ochetoma* 1 in Pigan Pass  
 Entomias eremicus 3. " "  
*Macrotis* 1 ♀ 2 ♀.

July 27 Went up to Pirgan  
Pass, a mile west of us and then  
up over the ridge of Pirgan Mts.  
where we saw 14 goats &  
would have gone on to the  
Hanging gardens but the wind  
carried us off our feet on the  
ridges & made travelling hard.  
+ dangerous & little could be seen.

The goats were moving to places of security among the shelves of cliffs where they could be out of reach, but were exposed to fierce winds.

A flock of 6 had one kid, another  
of 5 had 2 kids + another  
old goat + kid were on a shelf  
by themselves. Two lone  
goats were seen and one  
was going to the Sun Mtns.

on going to Wren Way  
Saw a Coon in the Roads.

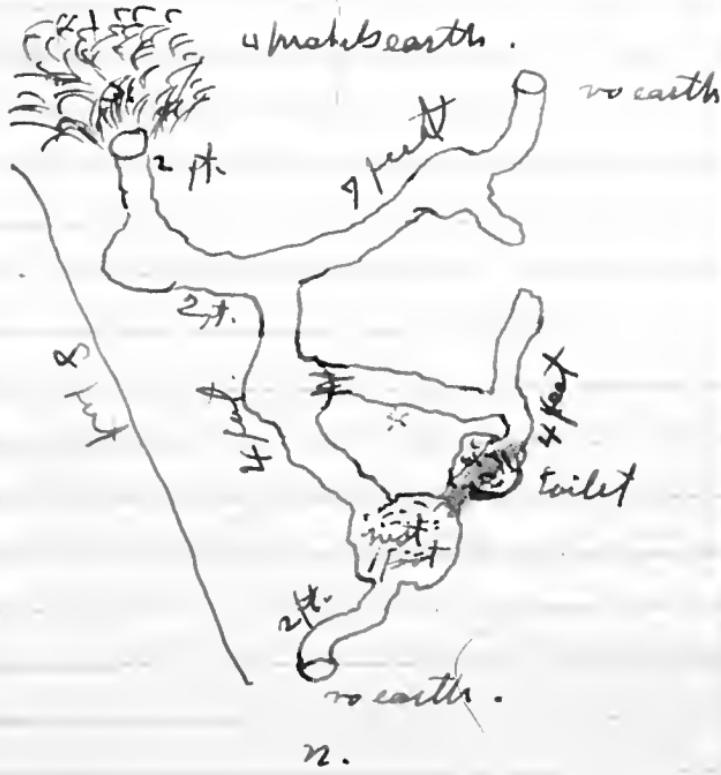
July 28, Wind blew so hard we could not go up the Mts., or set traps, & dug out Citellus columbianus den.

The mound at entrance was 5x6 feet 14 inches high & contained about 4 bushels of earth & indicated a winter den. I caught the ♀ at the entrance then dug out & mapped the burrow, which went directly under the base of a small fir tree. The main burrow was 3 to 4 inches in diameter & ran down a foot deep, then back 2 feet to a small chamber where it turned & 2 feet more to where it forked, then 4 feet more to a big nest chamber a foot in diameter & a foot below the surface. This was nearly full of old nest of last year with a little fresh grass (*Carex*) carried in lately & evidently used as a bed-chink.

at the present time. The nest was dry & warm & clean in the middle but old & damp & muddy at the bottom. A small tunnel ran out to the surface 2 feet back of nest & the main tunnel ran deeper down to a cavity where all the excrement was deposited at a spot below the surface in a half full old nest chamber. From here the burrow forked again & one branch returned to the second chamber & the other ran to a blind end. The den had 3 openings, four chambers, one nest & one toilet, no food chambers & no food stores. Its greatest length between doors was 8 feet & its greatest depth 2 feet.

The old female caught at the horizon was only a little fat; stomach full of green herbage.

" "



July 29 Broke camp & went down to Sun Camp and back up to Gunsight Lake & camped at lower end at 5276 ft. in meadow among alders & pines in edge of subalpine zone.

All heavy timber up to foot of Teton Mtn. where snow sheds have cleared off the timber & left willow & alder & other soft brush instead of trees.

Found one small *Thuya* *flexilis* about opposite upper end of St. Mary Lake, & some *Taxus* scattered along trail 3 to 4 miles above lake & *Fatsia* *bassiana* abundant in upper end of canyon up to Gunsight Lake, all overlapping species from the west slope of the Mts.

Big mule deer track down trail & a big Coyote's track without a hairy camp.

July 30 Found 2 ♀ Harlequin  
ducks in Griswold Lake,  
Austromus hindsii with big bushy  
tail & yellow belly dived a tree  
at old Chalet, Oreamnos americanus  
are numerous & hoary marmots  
are common at upper end of  
lake & Cougars were squeaking  
in rocks.

Cold & windy & rained &  
snowed in night, but we  
have a comfortable camp  
Saw beaverdams & ponds along  
St. Mary River.

Fansight Lake + Pass

Odocoileus a few tracks  
Oreamnos not com.  
Ovis - "  
Sciurus hard  
Tetramis bimac. 1 at lake  
" orocetes 2 in pass  
Citellus columbianus, com. over pass,  
+ at lake & below + at glacier.  
Marmota flaviventris, com. 4 yg. Aug.  
Callospermophilus, 1 near pass  
Neotoma macroura, signs com.  
Castor. 2 in lake,  
Erethizon trash below lake  
Canis latrans, 1 + tracks.  
Wren com.  
Bat 1 seen July 31 at camp  
Debotana bay, del seen near glacier  
Lepus bairdi, com.

July 31

July 31. Went over to Blackfoot  
Glacier, crossed first lobe and  
went out on much larger lobe  
of the second col main glacier  
Saw a large coyote coming  
across foot of glacier.

Aug. 1. over Piusight Pass  
to Lake Ellen Wilson & down to  
falls at lower end. Then back  
to camp. Got good notes  
& photographs in pass.

Aug. 2. Moved camp to our old  
camp near Piagan Pass  
at 7000 feet.

Aug. 3 - Came over Piagan Pass  
and down to Many Glaciers.  
Got *Coryn* & *Eulamias cruentus*  
in pass & took photographs of  
*Ptarogimus* & *Citellus columbianus*  
& *Macrotis* in pass.

Aug. 4., Camped on Swift Current River half way from Many Glacier to Shuburne Lake. Outfitting for long trip north to Belly River, Waterton Lakes & return.

Aug 5. Made up specimens & collected a few. Packed up ready for trip.

Heavy frost in morning.

Flies & mosquitos still bad.

Aug 6. Lost a day.

Aug. 7. Broke camp on Swift Current ad came to Reservation works at foot of Lower Shuburne Lake, then turned north over big ridge to Kennedy Creek ad camped near the park line on the South Fork.

Rained most all day.

Got notes of Stiphonos.

Aug. 28. Rained a little in morning. Lots of snow on Mts. A cold night but cloudy & no frost.

A trace of Transition zone on warm slopes of Kennedy Creek, a few *Betula fontinalis*, lots of *Elaeagnus argentea*, *Gaillardia* and other plains plants. The bulk of timber & vegetation however is Canadian and along the boulders and gravel stream bed of the creek *Dryas octopetala* & *Geobelia* from the Hudsonian zone are thickly strewed and both have gone to seed.

Crossed South fork at the line & limbed up the slope of Yellow Mountain to near timberline and crossed between the main ridge and Shurburne Peak, then across a wide Hudsonian zone slope where a new spruce with long

*Odocoileus macrotis*, trade & shed horn  
Thomomys hills, com. on S. Fork  
*Sciurus* com. in woods  
*Eutamias amoenus*, com. low down.  
" orocetes, 1 on point of Yellow Mts.  
*Ursus* tracks on trail.  
*Cervus Canadensis*, tracks in trail.  
Buffalo horns & skull at Ranger Station.  
*Ovis* horns " "  
Elk horns, a lot at " "  
*Odocoileus hemionus*, 1 horn "  
Deer - head on point of Yellow Mts.

drooping crest was the dominant tree, then down, down, down, to the north fork of Kennedy Creek and camped at the ranger station on the south base of Chief Mountain. Came only 8 or 9 miles, but it was enough with our heavy packs over the steep trails up & down. Camped in dense woods.

Colored zone was too high point on Yellow Mountain. Could see ~~Rock~~ Lake & 22 others from high point & out over plains into Alberta & the Sweet Grass Hills.

Aug. 8 - Followed up North Fork Kennedy Cr. to Slide Lake and then turned north over high ridge between Chief Mountain and Gable Peak, then down to South Fork of Belly River and camped just below fork of South and Middle. Came about 10 miles.

Stopped on top of ridge & followed goat & sheep trails along summit to base of Chief Mt. peak but found no sheep, tho tracks & hairs are numerous.

Saw 6 goats on point above Slide lake, one on peak of Gable and one old goat with kid at base of Chief Mtn. Lots of tracks & wool and the hairs along crest of ridge are worn deep.

Coyote tracks on all trails and across several fields & goat hair in droppings.

Chief Mtn. Ridge.

<i>Odocoileus hemionus</i>	tracks at timberline
<i>Oreamnos</i>	of seen - lots of tracks
<i>Ovis</i>	lots of tracks
<i>Sciurus richardsoni</i>	seen in woods
<i>Erethias amoenus</i> ,	seen in burns
" <i>felix</i>	at timberline
" <i>oreocetes</i>	seen at "
<i>Callospermophilus</i> ,	at & above timberline, com.
<i>Marmota flaviventris</i> ,	at & above timberline
<i>Thomomys</i> <del>fuscus</del> ,	hills at timberline
" <i>talpoides</i> ,	abn. at Belly R.
<i>Neotoma</i> ,	ate soap at ranger station.
	sign on rocks to above timberline.
<i>Peromyscus</i>	in cabin at Belly R.
<i>Zapus</i>	in meadow "
<i>Citellus</i>	abn. on Belly R.
<i>Erythronium</i>	signs in Belly R. Valley.

### Aug. 10. - Belly River.

Rode up South Fork about 8 miles to a point 2 miles above Elizabeth Lake, but it rained so hard I turned back without going to head of canyon. Shot a Franklin Grouse & saw tracks of Moose & goats & bear. Goat tracks were seen in trail along bottom of canyon & goat wool on bushes in woods.

Bear have dug over many rods of *Erythronium* root at end of Elizabeth Lake.

Wonderful mountains all around but obscured by clouds much of the day. Big, dense forest, ideal for bear woods.

Our camp at ranger station is in big meadow of good grass.

Chittenden Co., Vt.

2

Aug. 11 Went up to Crossley  
(The man's name was Crossley)  
Lake and Glenn Lake to about  
a mile of upper end. Followed  
old wagon road through beautiful  
woods of Lodgepole, spruce &  
fir woods but could not see  
out much of the way to either  
lake or mountains.

Open country & beautiful views  
along Crossley lake & at lower  
end upper end of Glenn lake.  
Both are beautiful sheets of water,  
deep & clear & dark blue with  
wooded shores & wonderful  
reflections of trees & mountains.  
The view from side of Crossley lake  
is one of the finest we have seen with  
Chocorua on one side & Cathedral  
Kipp & Merritt peaks at the head of  
canyon & the Otaney & Sheephead  
Glaciers, falls & snow fields in view.

A hotel or Chalet should be built here. A good auto road could run to the head of each branch of the canyon and lead through fine forests or along lake shore or mountain top. The lakes are full of good big trout of the cutthroat & Mackinac & of whitefish.

Saw a loon & 6 young Canada geese & a feeding moose & a porcupine that was the largest I ever saw. I estimated it weight at 35 lbs. but Bill Gurd put it at 45 & 50. It ate half a belly band & part of a batten & bridle & was chased out of camp two nights, then killed to save the horses.

Aug. 12 Went again up to head of ~~the~~ Glenn Lake & then up toward Shepherd Glacier but found no trail & woods so thick & big we could not get even to foot of the 3 high falls that come out of the Glacier.

Found some goat signs up on side of cliff but saw no game except 2 loons. Made a hard all day trip for little returns.

Aug. 13 Broke camp and worked down the Belly River to the Canadian line, about 6 miles where we camped near river. The line oblique as a wide road cut through dense lodgepole pine over the ridges both sides of river.

Lots of beaver work along river, some transitions, grass meadows,

Aug. 14, Continued down Belly River about 6 miles to below the beaverdams, then turned west off the wagon road and followed trails over low open hills to the Waterton Lake Valley, about 6 miles farther, then down around the lower end of Lower Waterton Lake across the wagon bridge and up the west side of the lakes to the summer camp at 2 miles  $\frac{1}{2}$  north of the U.S. line and camped. Came about 20 or 22 miles over good roads & trails, but it took all day.

A large part of the trip was in transition zone with open plains, good grass and *Balsamorhiza*, *Symphoricarpos occidentalis*, *Pulsatilla patens*, *Anemone borealis*, *Oreaster* + many new plants.

Billy R. & Waterton Lake, Aug. 14.

*Odocoileus hemionus*, tracks can.

*Scirus* intubus, —.

*Entomias lituratus*

*Citellus richardsoni*, co.-op. Billy R. Holz  
co. on Waterton Lake, W. side -

*Citellus columbianus* - c. at camp - Woterton.

Thomomys talpoides, em. all along.

Fiber - - postal bureaus.

Castor, ca. along Belly R.

*Canis lotensis*, c. - border. signs w/ hair,  
"nutria" ? signs, catly rais.

*Hesperomys amoenus* old per 52 cobs -

*Ursus americanus*, old bear & cub  
*Putorius longicaudus*, 1 day of nest & cub  
fetus

Ludroota den + surgic  
Aug 15 Watertown, N.Y.

Aug. 13 Waktar area.  
*Nyctaris canescens*, 1 in sunlight, 11 A.M.  
over edge of leets.

Canadian zone spruce & fir  
& aspens & balsam poplars &  
*Betula glandulosa* covers the cold  
slopes, gulches, cold bottoms,  
and in all nearly half the area.

The Waterton Lakes are like the others, wonderful bodies of pure cold water, between wooded shores, the upper lake being between the high rugged peaks in the deep glacial gorge.

Lots of *Citellus idahoensis* in  
the open flats of the Belly River up  
to a mile of the Park line &  
numerous holes & runs left near  
camp on the Waterton lake, but  
at camp there are only  
Columbines.

Aug. 15.- Went to upper end of Upper Waterton Lake on the boat with Capt. Hanson, about 6 miles. & returned to camp at lower end. The lake is low (4186 feet) and a slight element of transition zone species extends above it, tho' the forest is generally sober Canadian, Lodgepole, spruce & balsam & pretty dense and continuous.

The mountains rise high & steep and close on both sides of the lake.

Found a *Cannabitis familiaris* & 3 young at upper end of lake & a fish hawk's nest.

A porcupine had eaten the edges off a table at the ranger cabin & woodrats had made nests in his storehouse.

Aug. 16. Worked down the valley  
toward lower Waterton Lakes.  
and camp.

Aug. 17. Broke camp and followed  
up trail to Old City & then up  
to Wall Lake where we can  
get a good view of the Kintla  
Glacier by climbing the ridge  
above.

Came through burnt timber  
to Old City where an old  
prospect well is still trying  
to keep alive. Then through  
thick timber to the lake at  
edge of timberline on steep N.E. slope.

The lake is small and wooded on 3 sides  
but snowbanks lie along the cold edges.  
Mr. Yard caught 12 fine trout in the lake  
for supper. *Citellus columbianus*  
are numerous & noisy around camp.

Wall Lake & ridge above Aug. 18.

Oreamnos, tracks & signs & trails  
*Sciurus nebrascensis* —  
Eutamias  
*Citellus columbianus*, ab. to

Aug. 18. Went up past Wall lake ad on the ridge to the west of it where we had a glorious view of Upper Kintla Lake, Kintla Peak ad Glacier & the Agassiz Glacier.

The mountains in this region are the finest of the Park, high & rugged & with many large ad small glaciers. From the head of Upper Kintla Lake a trail can easily be made up to the middle of Agassiz Glacier & others to the high passes & peaks of a wonderful Alpine region.

Colored in zone map as far as I could see.

The western tamarac is said to be common to head of Upper Kintla Lake ad over 3000 feet above it I could see the tall trees standing above the black spruces & firs.

Wall Lake <sup>B.C.</sup> Aug. 19.

Zapus 2, ♀  $\frac{J}{I}$ , ♂  $\frac{A}{I}$ , P.  $\frac{1}{I}$ , Gales  $\frac{1}{I}$ .

Mammary glands 4, overlapping but separate - very large & wide & full.



Long fast nursing but glands still large & containing milky fluid, not fat;  
Stomach <sup>Intestines</sup> very large & full of grass & cereal seeds. Must fatten rapidly.

Sorex obscurus ♀. J.  $\frac{I}{I}$ , A  $\frac{2}{2}$ . all as  
2 mammary glands, very long & large.



The dense stand of spruce & fir & larch poles pines carries Canadian zone well up on the slopes to about ~~8000~~<sup>7500</sup> on warm & ~~6500~~ or cold slopes

Hudsonian runs 1000 feet above ad the ridge where we reached is about 8000 feet ad above extreme timberline, tho a few dwarf abies run to the peak. We are close to Boundary Peak on the same ridge 500 feet higher.

*Abies*, *Picea*, *Pinus albicaulis* & *Taix lyallii* are the timberline trees, the tamarack in abundance reaching through Hudsonian zone to extreme timberline. While not quite so hardy on wind swept slopes as Abies it is taller & more of a tree to its limit. When the other 3 trees are decapitated a little lower it stands 30 or 40 feet high as a sturdy tree.

Aug. 19. Returned to Waterton Lake,

Aug. 20. Up past Waterton Lake to  
Reynolds Cabin.

Aug. 21. Remained at Reynolds Cabin  
and worked up the valley and around  
the lakes while Mr. Yared went  
to Browns Pass and back.

Saw lots of birds and tracks of deer  
and bear & coyote & porcupines  
and in PM wrote up back  
notes.

Aug. 22. Broke camp and followed  
up valley through 4 miles of  
magnificent forest of mainly  
engelmann spruce. Trees 100 feet  
high & 3 and 4 feet through.

Some lodgepole pine & fir and a little  
douglas spruce mixed through and  
one tamarack tree, Lysil-

Then climbed up through  
alders & willows of a big slide  
track about 1000 feet & then  
another 1000 through open  
forest & timberline meadows to  
the summit of what the guides  
call Flat-top, but really  
a great shoulder of Kipp Mtn.  
The real pass from Waterton  
Valley to McDonald Valley  
lies 1000 feet below us at  
6000 feet with a gentle slope  
up each side and a natural  
& the lowest highway across  
the range.

Our summit is 7000 feet &  
pure hudsonian, mainly trebles  
and beautiful grassy & flowery parks.

Came down about 500 feet &  
camped on Kipp Creek at  
edge of timber.

Saw 5 white tail deer & 15 goats.

Whitetail deer, 5 above timberline  
Goats, tracks along Kootenai Creek a high up.  
Saw 15 goats along high ridges &  
at head of Cattle Queen Cr.  
Black bear tracks along trails & a bear in camp.  
Silver tip, reported in camp, seen by Purd.  
Porcupine tracks along trail both sides.  
*Citellus columbianus*, abn. at camp  
& all over upper slopes.  
*Eutamias amoenus*, heard in woods &  
one seen. sharp voice -  
*Sciurus richardsoni*, com.  
Zakus, 1 dead & several seen.  
Prairie dogs. com. at Reynolds Cabin.  
Swallows, -  
*Micromys macrourus*, com. above timber.  
Octotoma, heard high up.  
*Thomomys nivaria*, com.  
Coyote, tracks com. all along trails.

### Aug. 23 To Granite Park.

Followed down Kipp and  
Hawks Mineral Creek to near  
junction with McDermit Cr. -  
then turned up ridge to  
Granite Park & camped.

Found superior forest of  
Spruce & fir along Mineral Creek  
and on hot slopes low down  
*Pinus monticola* & *taeda* occasional  
are common. Found one *Thuja*  
*pliata* & lots of *Tayenus* &  
*Fatsia japonica*, *Sasa* pilla,  
& on open slopes *Holodiscus*.  
Mapped warm slopes as transition  
up to 4500 feet.

A big fir with flat branches  
& green cones looks like  
candles but I could get only  
a branch. A *Picea* with  
long, green cones is not engraving.

The undergrowth is dense & rank  
and ferns are big & abundant.  
Saw 2 species low down & two  
more high up ..  
Camped at Granite Park after  
a steep climb of nearly 3000 feet.

Aug. 24 Went in to Many  
Glaciers & packed up for trip  
to west side.

Aug. 25 - Took stage to Glacier  
Park Station and waited over  
night for morning train to  
Belton by daylight.

Aug. 26 Left Glacier at 10 AM.  
+ reached Belton at 12 &  
Lodged at head of Lake M.C.  
Donald at 1 PM.

Aug. 27. Went up M.C. Donald Creek  
7 miles and found kelequin ducks  
& water ouzel nest.

Saw a bear eating service berries  
and tracks of moose, deer, mink &  
cougar.

Aug. 28, Went over summit of ridge  
north of lake to front lake valley  
and back. Lots of birds, some tracks  
and small game.

Aug. 29, Wrote reports.

Aug. 30 - Wrote and tramped around  
lake. saw a martin climb a tree  
and went up after him and watched  
him jump across to another  
tree and then to the ground.

Aug. 31, Returned down lake and over  
to Belton. A little snow in night  
has whitened the peaks. Cooler.  
The weather has been very hot and dry  
and big fires are raging S & W. of here.

Ran down to Columbia Falls  
and saw the taxidermist, E. S. Bryant,  
and got many important notes on  
birds and mammals. Also was able  
to check up the life zone areas.

The western slope of the Glacier Park  
shows peculiar good conditions, the  
lower warm slopes showing a great  
mixture of Canadian and Transition zone  
species, the trees being mainly Transition  
and the undergrowth where the sun  
never shines on the cool ground  
being carpeted with Canadian zone  
species such as *Picea pungens*, *Limata*,  
*Zyrilla*, *Cornus canadensis*,  
*Clintonia uniflora*, with such *Taxus*  
+ *Fatsia*. The effect of deep shade  
heavy snows, + humidity certainly  
soil results in the same associates  
of plants as occurs on the Pacific Coast  
slopes of Oregon.

Glacier Nat. Park.

Arctic Alpine zone Plants -

*Polygonum capitatum*

*Silene acaulis*

*Draba*

"

*Salix*

"

*Oxytropis*

*Saxifraga*

*Potentilla*

*Aquilegia caerulea*

*Arenaria*

*Antennaria*

*Myosotis*

*Anemone*

*Sibaldia*

*Cladonia ovalifolia*

### Hudsonian Zone Plants

*Pinus albicaulis*

*Abies lasiocarpa*

*Picea engelmanni*

*Salix*

"

*Ozoclearia oxycephala*

*Bryanthus empetrifolius*

*Kalmia glauca*

*Cassiope*

*Dryas octopetala*

*Phaselia*

*Pulsatilla occidentalis*

*Rubus idaeus*, *strigosus*,

*Goditia*

*Oxaria digyna*

*Silene acaulis*

*Saxifraga*

*Vaccinium*

*Armeria*

*Stellaria*

<i>Orthocarpus</i>	white
<i>Pedicularis</i>	purple
"	
<i>Elephantella</i>	white
<i>Astragalus</i>	purple
"	
<i>Arenaria borealis?</i>	
<i>Polystachyon confertum</i>	
<i>Allium</i>	
<i>Gentiana</i>	
<i>Sedum</i>	
<i>Sibaldia procumbens</i>	
<i>Delphinium</i>	
<i>Hypoxis</i>	
<i>Vaccinium davosa</i>	

### Canadian Zone Plants -

*Pinus Murrayana*  
" *flexilis*  
*Picea engelmanni*  
*Abies balsamea*  
*Populus tremuloides*  
" *balsamifera*  
*Acer glabrum*  
*Alnus*  
*Salix*  
"  
"

*Sorbus sambucifolia*  
*Lipargyrea canadensis*  
*Sambucus racemosa* and  
*Pachystima myrsinites*  
*Betula glandulosa*  
*Zopheranthemum tarax*  
*Ribes*  
*Grossularia*  
*Vaccinium erythrocarpum*  
" *ovatum*

*Loriaria involucrata*  
" *conjugialis*

*Juniperus communis*

*Rubus nuttallii*

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### Transition zone Plants

- *Pseudotsuga*
- *Populus angustifolia*
- *Anemone*
- *Prunus melanocarpa*
- *Juniperus procumbens*
- *Berberis repens*
- *Aristostophytes uva-ursa*
- *Balsamorhiza sagittata*
- *Gaillardia*
- *Leucanthemum argenteum*
- *Betula fontinalis*
- Thuya
- *Ribes d. irreguum*
- *Philadelphus lewisii*
- *Rubus strigosus*
- *Balsamorhiza*
- *Gaillardia*
- *Lupinus*
- *Acanthus ocularius*



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307 ship <sup>commod</sup> was Mary Glazier  
in March <sup>1917</sup> by Walter Scott Gibb

